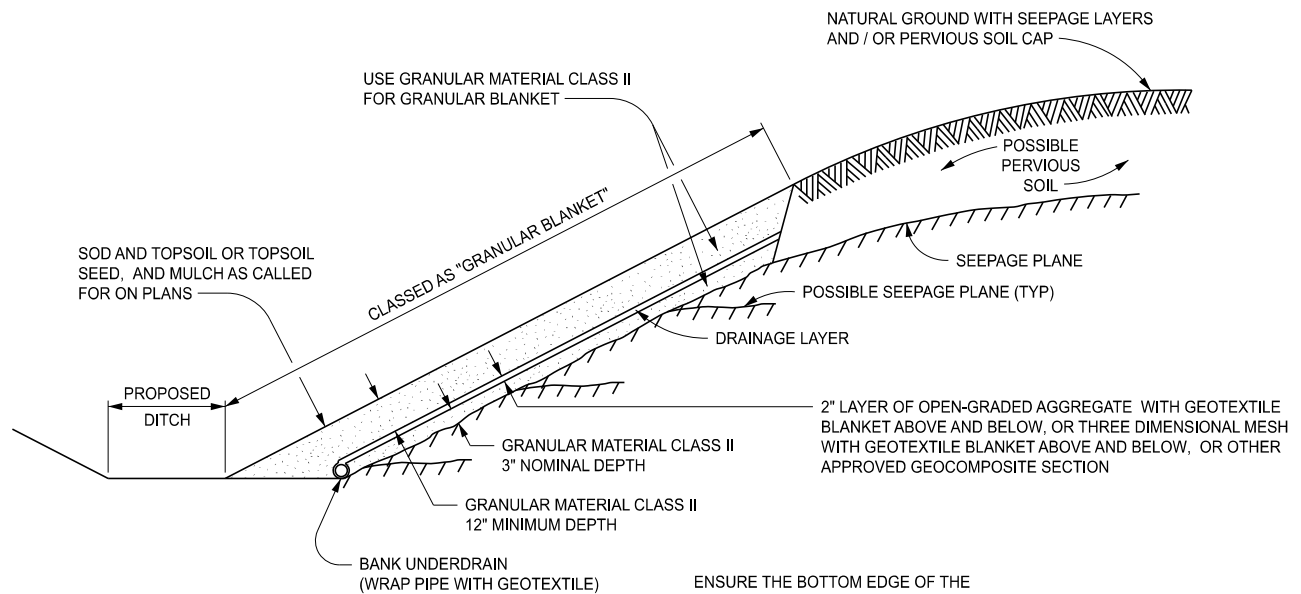
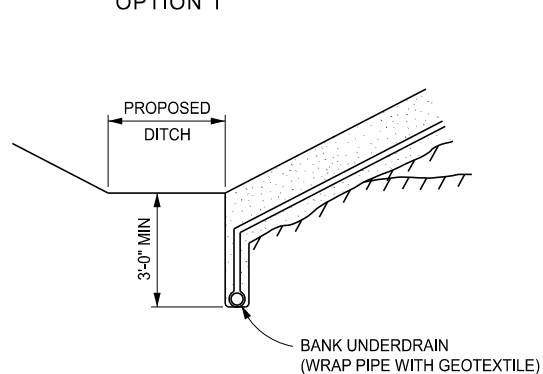


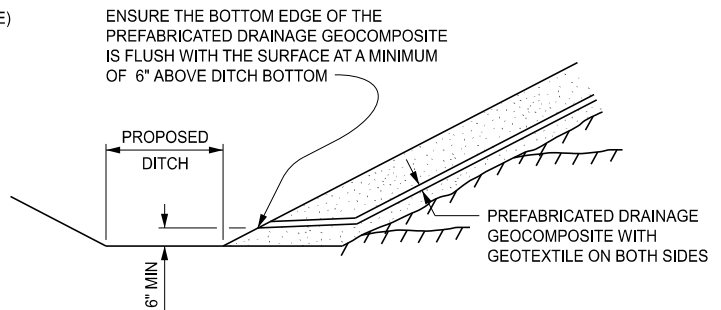
GRANULAR BLANKET TYPE 1



OPTION 1



OPTION 2



OPTION 3

NOTE: OPTION 1, 2, OR 3 WILL BE DETERMINED BY THE ENGINEER BASED ON THE PROJECT CONDITIONS.

GRANULAR BLANKET TYPE 2

APPROVED BY: _____
DIRECTOR, BUREAU OF FIELD SERVICES

APPROVED BY: _____
DIRECTOR, BUREAU OF DEVELOPMENT



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

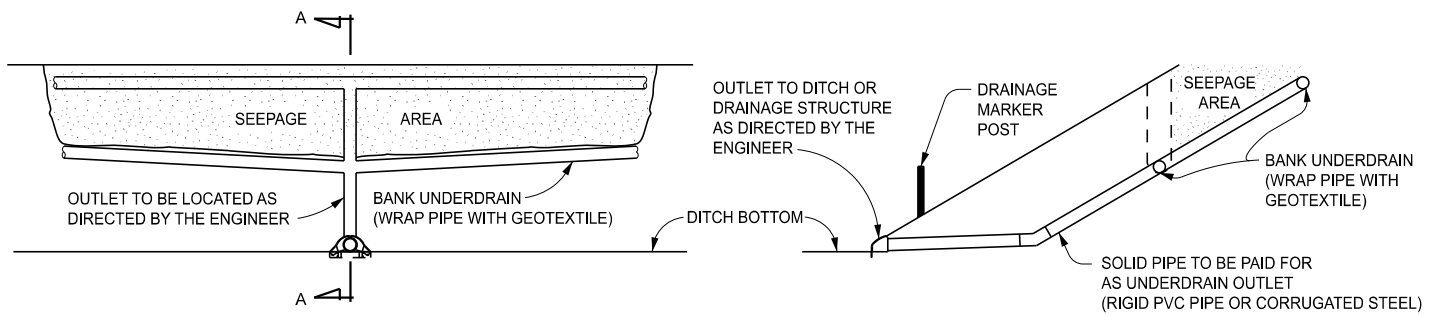
STANDARD PLAN FOR
GRANULAR BLANKET, UNDERDRAINS, OUTLET ENDINGS
FOR UNDERDRAINS, AND SEWER BULKHEADS

SPECIAL DETAIL
FHWA APPROVAL

04/02/2025
PLAN DATE

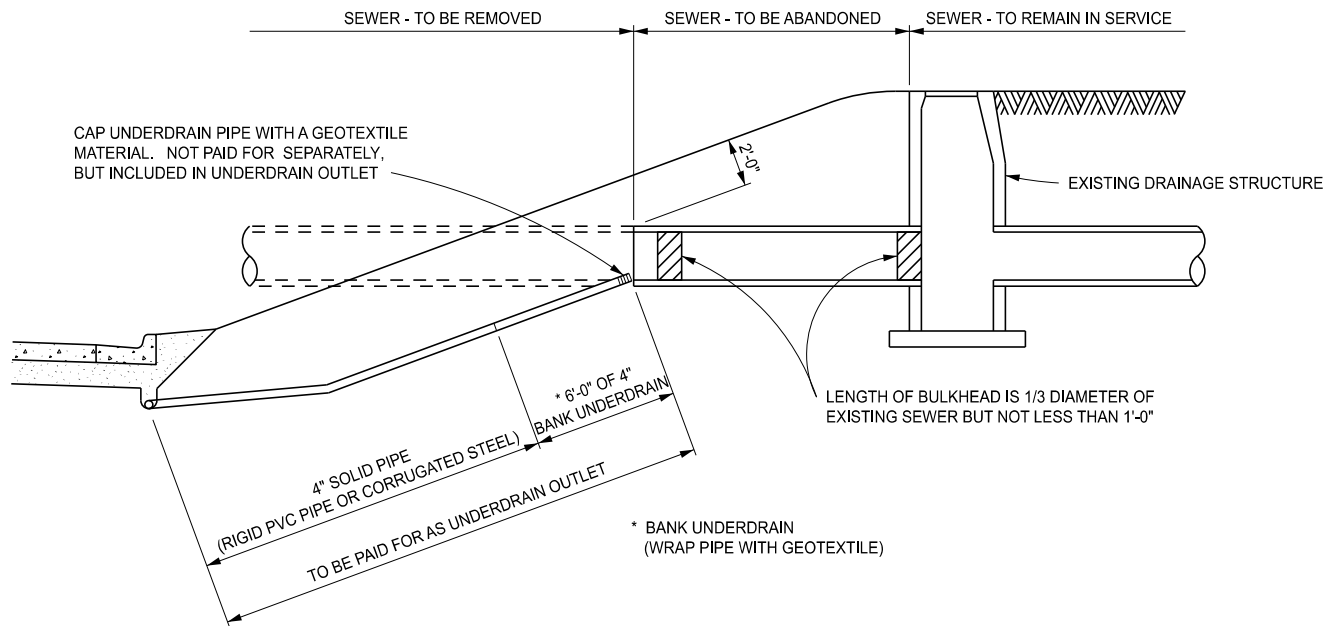
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SECTION A - A

BANK UNDERDRAIN OUTLET



WEEPER UNDERDRAIN AND BULKHEADING SEVERED SEWER



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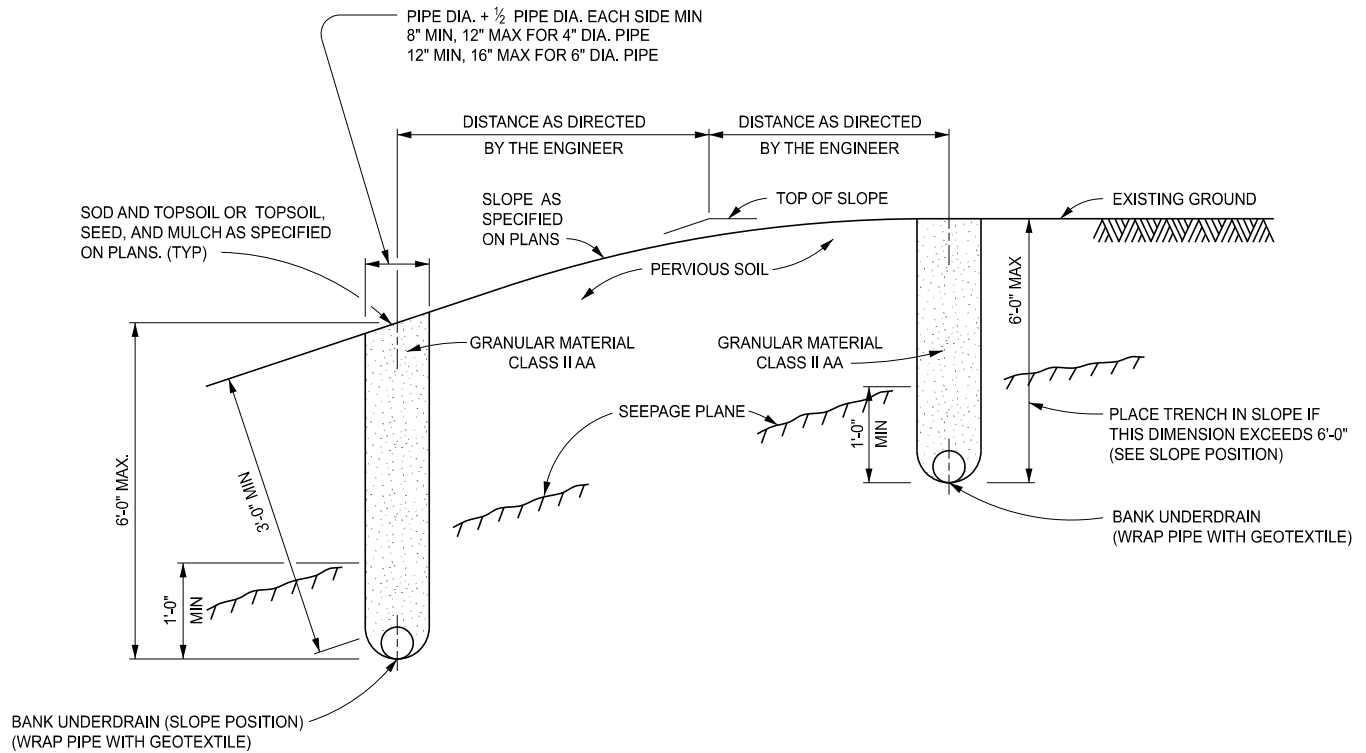
STANDARD PLAN FOR GRANULAR BLANKET, UNDERDRAINS, OUTLET ENDINGS FOR UNDERDRAINS, AND SEWER BULKHEADS

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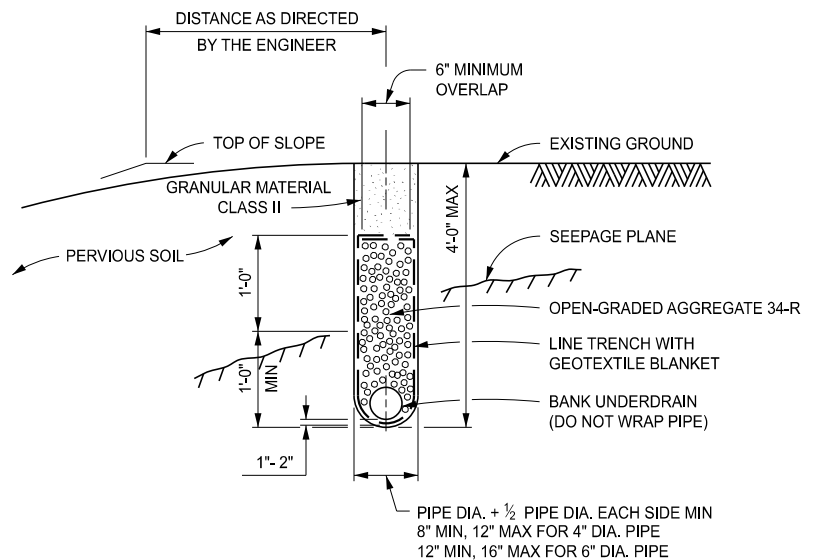
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BANK UNDERDRAINS



BANK UNDERDRAIN, OPEN-GRADED



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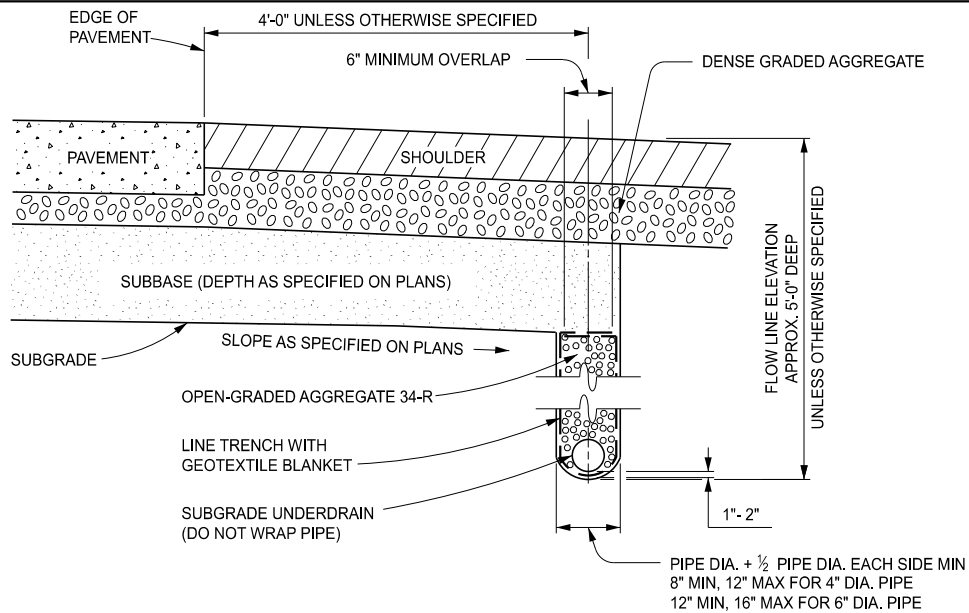
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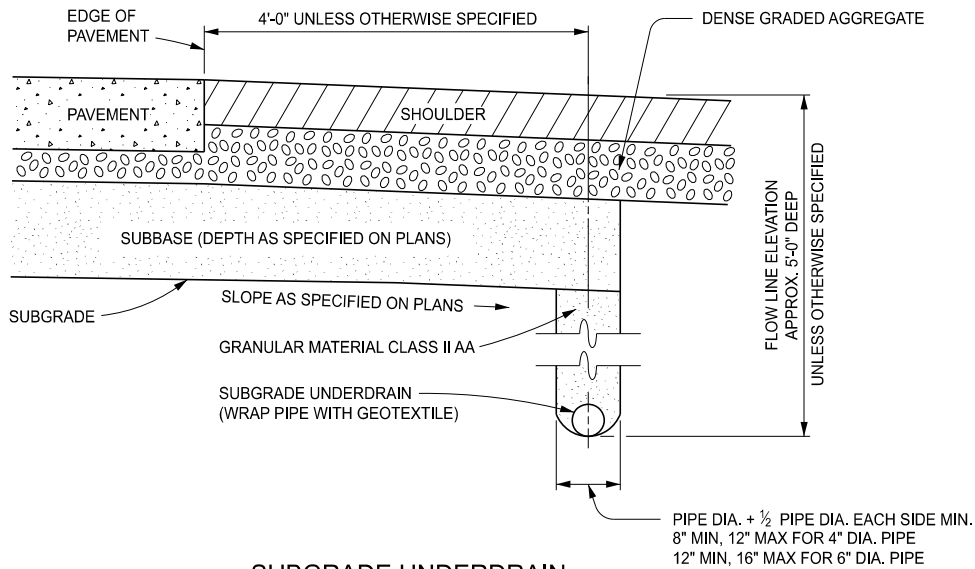
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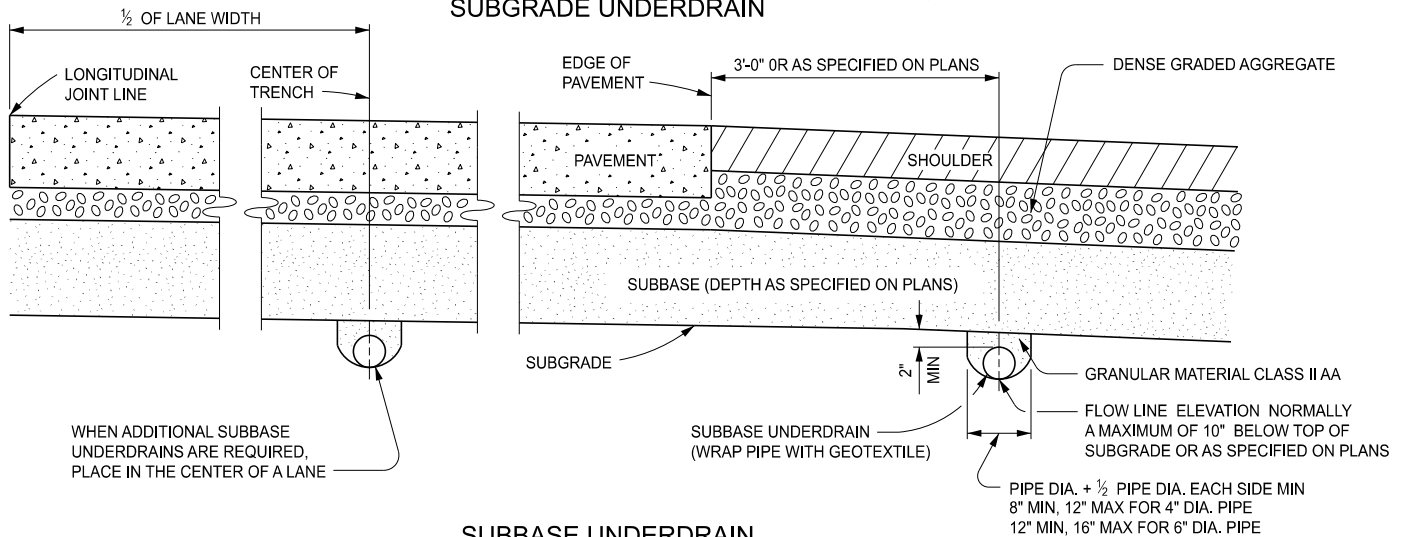
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SUBGRADE UNDERDRAIN - OPEN-GRADED

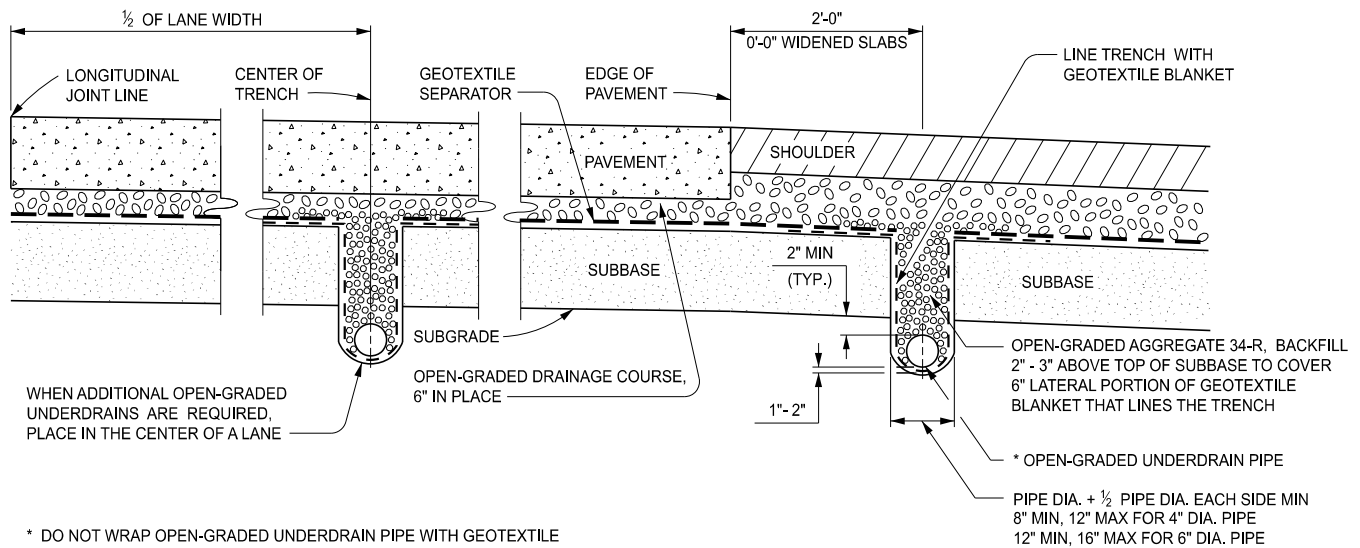


SUBGRADE UNDERDRAIN

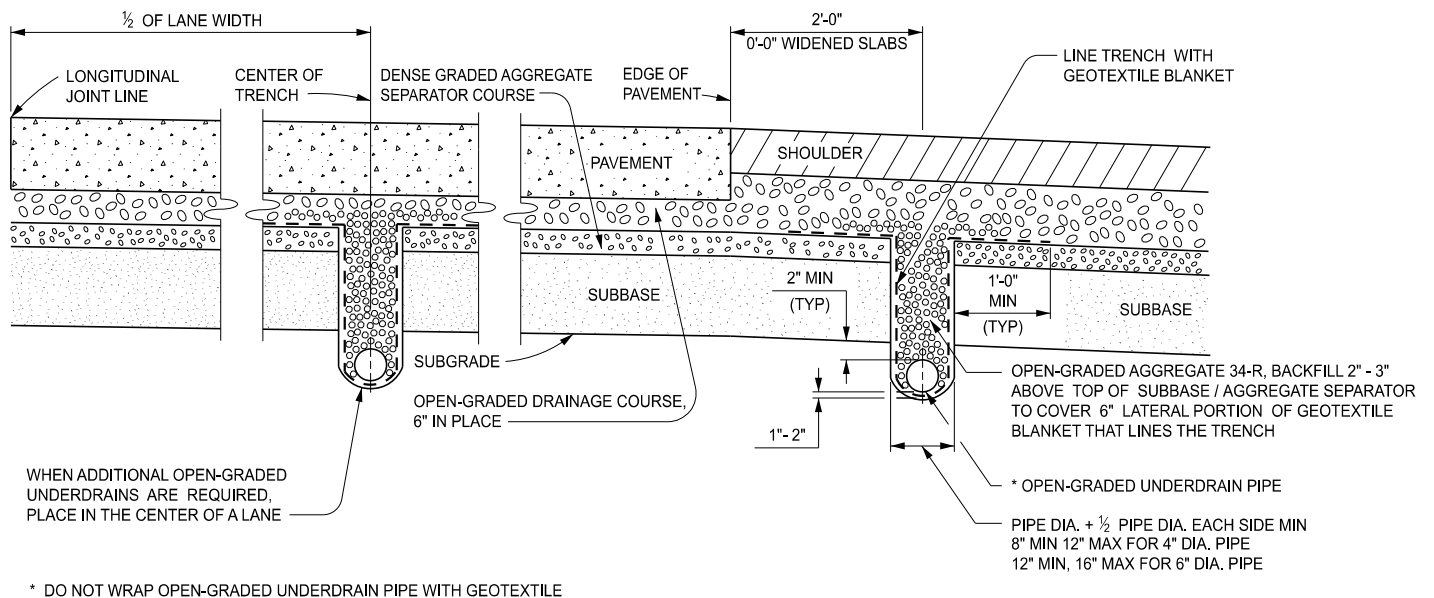


SUBBASE UNDERDRAIN

 <p>Michigan Department of Transportation</p> <p>DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE</p>	<p>STANDARD PLAN FOR GRANULAR BLANKET, UNDERDRAINS, OUTLET ENDINGS FOR UNDERDRAINS, AND SEWER BULKHEADS</p>			<p>SHEET 4 OF 8</p>
	<p>SPECIAL DETAIL FHWA APPROVAL</p>	<p>04/02/2025 PLAN DATE</p>	<p>R-80-F</p>	



OPEN-GRADED UNDERDRAIN PIPE WITH GEOTEXTILE SEPARATOR



OPEN-GRADED UNDERDRAIN PIPE WITH DENSE GRADED AGGREGATE SEPARATOR COURSE



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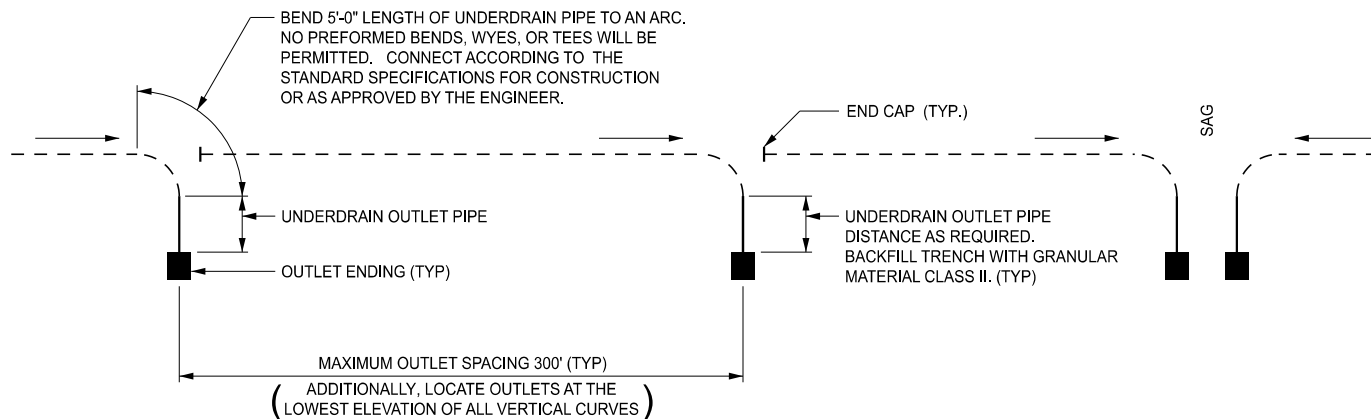
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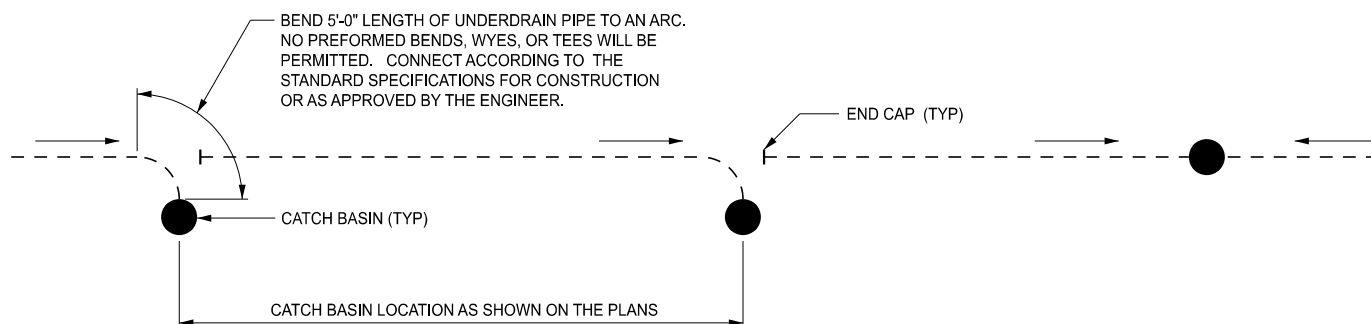
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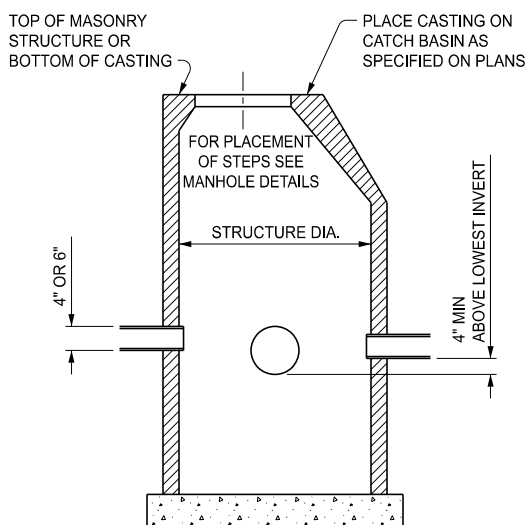
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PLAN SHOWING OUTLETS FOR UNDERDRAINS



PLAN SHOWING UNDERDRAINS TAPPED INTO CATCH BASINS



PROFILE VIEW



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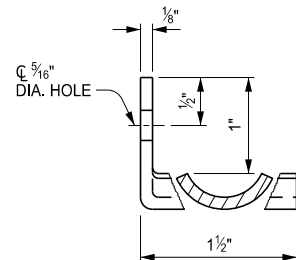
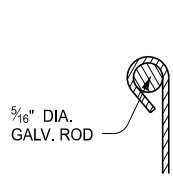
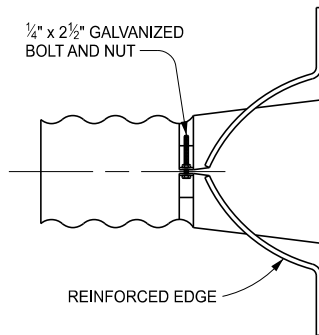
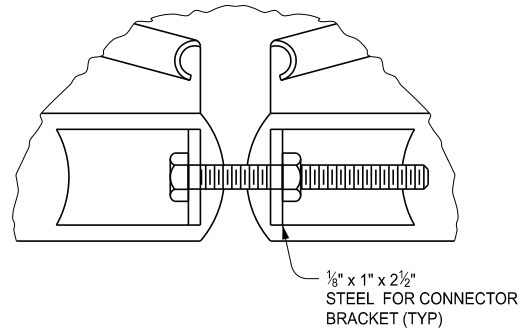
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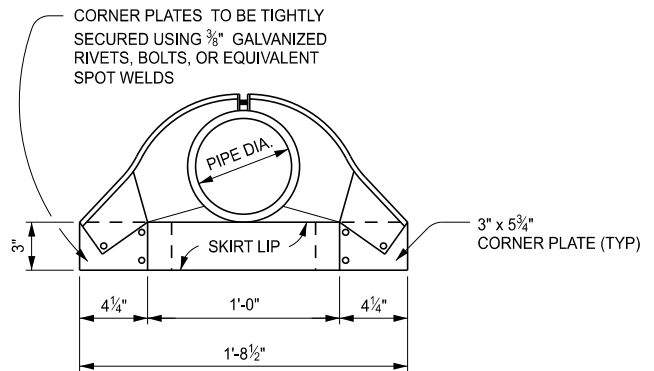
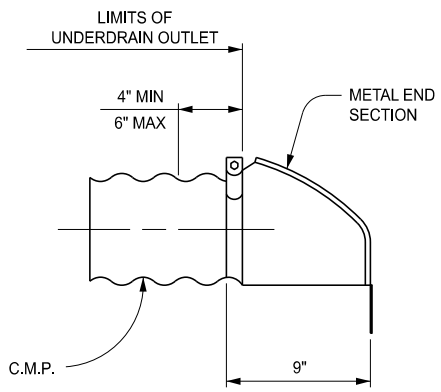
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REINFORCED EDGE
DETAIL

CONNECTOR BRACKET
DETAIL



STEEL END SECTION FOR 4" OR 6" PIPE



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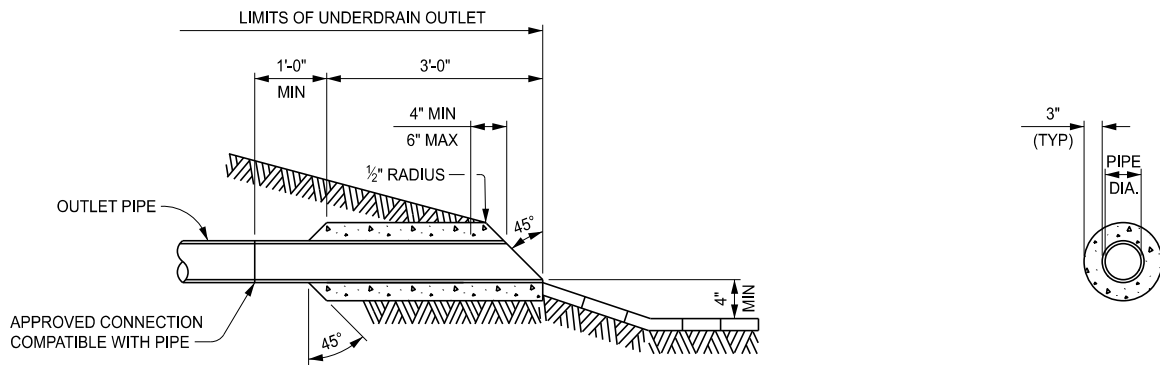
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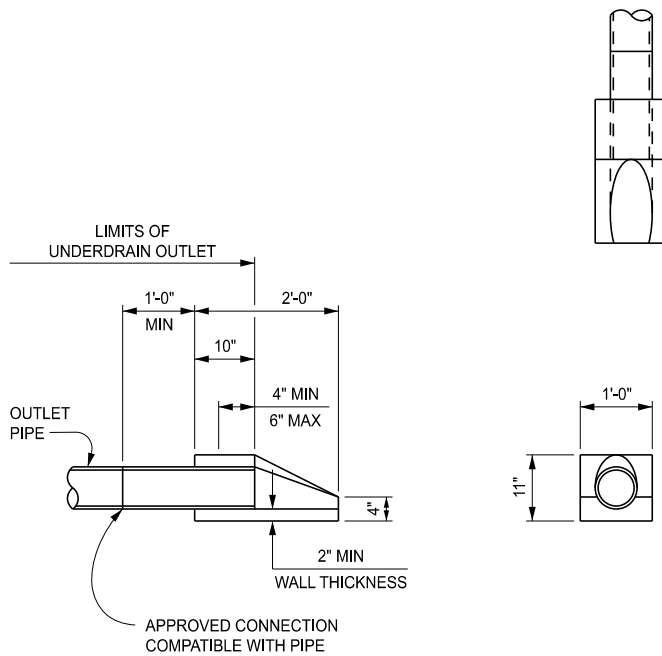
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CONCRETE RING FOR 4" OR 6" PIPE



CONCRETE END SECTION
FOR 4" OR 6" PIPE

NOTES:

PROVIDE POSITIVE DRAINAGE FOR UNDERDRAINS AND UNDERDRAIN OUTLETS.

ENSURE UNDERDRAIN PIPE SIZES ARE AS SPECIFIED ON THE PLAN.

CONSTRUCT CONNECTIONS BETWEEN UNDERDRAIN PIPE AND UNDERDRAIN OUTLET PIPE ACCORDING TO THE STANDARD SPECIFICATIONS FOR CONSTRUCTION AND AS APPROVED BY THE ENGINEER.

ENSURE CONNECTIONS, IF REQUIRED WITHIN THE OUTLET PIPE, ARE ACCORDING TO APPLICABLE ASTM SPECIFICATIONS REFERENCED IN THE STANDARD SPECIFICATIONS FOR CONSTRUCTION, ARE WATER TIGHT, AND OF THE SAME MATERIAL AS THE OUTLET PIPE.

ENSURE OUTLET CONNECTIONS TO DRAINAGE STRUCTURES ARE ACCORDING TO THE STANDARD SPECIFICATIONS FOR CONSTRUCTION FOR DRAINAGE STRUCTURES.

USE ONLY RIGID PVC OR CORRUGATED METAL FOR UNDERDRAIN OUTLET PIPE .

CAST THE CONCRETE RING OR CONCRETE END SECTION AROUND THE SAME TYPE OF PIPE THAT IS USED FOR UNDERDRAIN OUTLET PIPE.

ATTACH STEEL END SECTIONS TO THE ENDS OF CORRUGATED METAL PIPE AS SPECIFIED ON THIS STANDARD PLAN, BY STANDARD METAL BANDS OR BY OTHER CONNECTING DEVICES AS APPROVED BY THE ENGINEER.

DO NOT USE STEEL END SECTIONS ON PVC OUTLET PIPE. USE CONCRETE END SECTIONS.

REROLL THE ENDS OF HELICALLY CORRUGATED PIPE (EXCEPT PERFORATED PIPE) TO FORM ANNULAR CORRUGATIONS FOR CONNECTING THE END SECTION.

DO NOT USE GRANULAR MATERIAL PRODUCED FROM CRUSHED PORTLAND CEMENT CONCRETE FOR ANY BACKFILL MATERIAL.



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STANDARD PLAN FOR
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